REMARKS

Claims 1-17 are pending in the present application.

The Examiner has required election in the present application between:

The Examiner has required election under 35 U.S.C.§§121 and 372 in the present application between:

Group I, claim(s) 1, drawn to a peptide having β-ionone ring-2-hydroxylase activity.

Group II, claim(s) 2-6, drawn to a gene encoding a peptide having β-ionone ring-2-hydroxylase activity and a microorganism comprising thereof.

Group III, claim(s) 7 and 8, drawn to a method of making a hydroxylated carotenoid using a microorganism comprising a gene encoding a peptide having β-ionone ring-2hydroxylase activity.

Group IV, claim(s) 9 and 10, drawn to 2, 2,'-dihydroxy-β,β-carotene-4, 4'-dione and an antioxidant comprising thereof or 2-hydroxy-β,β-carotene-4, 4'-dione.

Group V, claim(s) 11-15, drawn to a gene encoding a peptide having β-ionone ring-3-hydroxylase activity and a microorganism comprising thereof and a method of making a hydroxylated carotenoid using thereof.

Group VI, claim(s) 16, drawn to a method of making a hydroxylated carotenoid using a microorganism comprising a gene encoding a peptide having β-ionone ring-3-hydroxylase activity.

Group VII, claim(s) 17, drawn to a gene encoding a peptide having geranylgeranyl pyrophosphate synthase activity.

The Examiner asserts that the inventions listed as Groups I-VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The special technical feature of Group I is asserted to be a polypeptide having β-ionone ring-2-hydroxylase activity. The special technical feature of Groups II-III is asserted to be a polynucleotide encoding a polypeptide having β-ionone ring-2-hydroxylase activity. The Examiner asserts that both a peptide having β-ionone ring-2-hydroxylase and a polynucleotide encoding thereof are known in the prior art and therefore, do not make a contribution over the prior art (e.g., Misawa et al., J. Bacteriology, 1990, 172, 6704-6712, form PTO-1449 filed July 25, 2006, reference CA). The special technical feature of Groups V-VI is asserted to be a polynucleotide encoding a polypeptide having β-ionone ring-3-hydroxylase activity. Both a polypeptide having β-ionone ring-3-hydroxylase activity and a polynucleotide encoding thereof are also asserted to be known in the art and therefore, do not make a contribution over the prior art. The special technical feature of a carotene of Group IV is a carotenoid that is a chemical compound of a nonpeptide or a non-polynucleotide structure. The Examiner asserts that a carotenoid is known in the art and therefore, it does not make a contribution over the prior art. Groups II and VI are drawn to methods for preparing a carotenoid. Methods for producing carotenoid are known in the art and include using non-recombinant and recombinant microorganisms as well as isolated substrates and enzymes. Special technical feature of Group VII is a polynucleotide encoding a polypeptide having geranylgeranyl pyrophosphate synthase activity. A polynucleotide encoding a polypeptide having geranylgeranyl pyrophosphate synthase activity is known in the art and therefore, does not make a contribution over the prior art. Applicants traverse the restriction of the claims and withdrawal thereof, with rejoinder of the claims, is respectfully requested.

The claims in Groups I-III (i.e. claims 1-8) are directed to a novel polypeptide having β-ionone ring-2-hydroxylase activity (CrtV), a polynucleotide encoding the novel polypeptide, a microorganism comprising the polynucleotide and method of making a hydroxylated carotenoid using the microorganism. The polypeptide disclosed and claimed in the present application is novel and was discovered by the instant inventors.

The Examiner incorrectly states, as the basis for the restriction requirement regarding Groups I-III, that the polypeptide of the claims of Groups I-III is the same as that disclosed in Misawa et al., J. Bacteriology 37:6704-6712 (1990), i.e. the Examiner states (incorrectly) that polypeptide of claims 1-8 is not novel. However, while the protein disclosed in Misawa et al. and the polypeptide of the invention both have a hydroxylase activity, they are not the same proteins. The instantly claimed protein (i.e. the protein as claimed in the claims of Groups I-III, is a β-ionone ring-**2**-hydroxylase (CrtV) while the protein disclosed in Misawa et al. is a β-ionone ring-**3**-hydroxlase (CrtZ). As such, the claims of Groups I-III are so linked as to form a single inventive concept under PCT Rule 13.1. Rejoinder of Groups I-III, claims 1-8, is therefore respectfully requested.

For the purpose of examination of the present application, Applicants elect, with traverse, Group II, Claims 2-6.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact MaryAnne Armstrong, Ph.D., Registration No 40,069 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

☒ Attached is a Petition for Extension of Time.

☒ Attached hereto is the fee transmittal listing the required fees.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to our Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under § 1.17; particularly, extension of time fees.

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Respectfully submitted,

By _____
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